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THE

ELECTROLYTIC TREATMENT OF CANCER.

BY

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ANY considerations in regard to the treatment of cancer must of necessity be of little interest or value, unless they are based on some reasonable theory of its origin. The theory of the blood-origin of cancer has in the past been universally accepted, and to-day even, it is probable that the majority, both in and out of the profession, believe some materies morbi in the blood to be the original cause of the local cancerous manifestations.

Others, while hesitating to accept such a statement unreservedly, look upon the disease as necessarily constitutional. It is not at all strange that such should be the generally accepted view, since Paget, and nearly all the older pathologists, teach that some morbid material in the blood must coexist with some special condition of tissue "appropriate to be the seat of growth incorporating that material." This ancient theory has strong arguments for its support, and it certainly seems

6-34
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hard to explain some of the symptoms of this terrible disorder on any other hypothesis.

I think it may be regarded as fortunate that another theory has been advanced—that of the local origin of cancer in its early stages—and that so many keen observers of the present day have argued so plausibly in its favor. Viewing cancer as primarily a blood-disease, we have very properly and logically adopted constitutional treatment. We have deprecated early extirpation by the knife, and, in the vast majority of instances, operations have been performed only after the growth has been fully developed, and too frequently after the so-called cancerous cachexia has become manifest. On the other hand, if we regard this disease as primarily of local origin, it will be proper to reverse the old and accepted methods of procedure. Early operations will be the rule rather than the exception, and instead of using stimulants and constitutional remedies with a view to counteract the supposed poisonous state of the system, we shall possibly more and more come to recommend a light form of diet, with no stimulants.

This remark applies of course only to the disease in its early stage, and before there is any approach to constitutional disturbance.

Cases are not wanting in which hemorrhoids and certain forms of benign external tumors have become absorbed under a persistently rigid system of diet. It is well known that when the body is feeding on itself it does not spare adventitious tissue, and when, according to Dr. Morgan, a uterine cancer has been known to disappear under a vegetable diet, just sufficient to sustain life, the question as to the possibility of "starving the disease out" is to say the least suggestive. Hard as it may be at first thought to reconcile some of the symptoms of cancer with other than a constitu-

tional or blood-origin, it seems to me at least equally difficult, after an acquaintance with the views of Virchow and Van Der Kolk, of Mr. C. H. Moore of London, and others, to regard the disease at its first inception other than of local origin—either with or without a constitutional tendency. One of the most interesting and clearly suggestive contributions in support of this theory is the brochure of De Morgan,* whose experience has been large, and whose generalizations are worthy of wide dissemination.

In all ages tradition has ever been regarded as the most conclusive of proofs; hence the general assent to this idea of the constitutional origin of cancer as the only true or even plausible theory. The indisputable fact of the almost universal reappearance of cancer after its removal is one of the strongest arguments in favor of a specific dyscrasiæ. There are not a few instances certainly where cancer, after extirpation, has never reappeared; but those on the side of its constitutional origin claim that this fact is of but little account as against the doctrine of blood-poisoning, since, after removal, the disease has in many instances returned, after as great a lapse of time as has ever intervened between the extirpation of such growths and the subsequent death from other causes of the individuals operated upon. On the not very well grounded assumption that a cancerous tumor is a sort of eliminating organ, and in its relations to the *materies morbi* occupies much the same position as a secretory gland towards the eliminated matter, it is claimed in these cases of non-recurrence after removal, that the original blood-taint had become exhausted at the time of the

* The Origin of Cancer, considered with reference to the treatment of the disease, by Campbell De Morgan, F.R.S. J. & A. Churchill, Publishers, London, 1872.

operation. Paget again teaches that two conditions are necessary for the development of cancer, viz., a "morbid material in the blood, and a special condition of tissue"—hence the occasional failure of a malignant tumor to reappear after its removal results from the absence of any fit nidus for its reproduction. According to this theory the blood may be cancerous through a long life without any local manifestation of cancer; and if it seems difficult to account for this local manifestation on any other ground than a blood-origin, it certainly seems equally difficult to believe that cancerous elements may be for years flowing through the body and yet give no evidence of its presence.

The cancerous cachexia upon which so much stress is laid may in many respects be said to be a myth. Vary rarely, if ever, are the first manifestations of malignant tumors associated with a cancerous cachexia.

A woman may have a fully developed scirrhus of the breast for months, and even years, and exhibit no marked failure of strength or color, and it is a well recognized fact, that cancer selects, frequently, the strong and ruddy. In most diseases known to be of blood-origin, there occurs, within a very short time, a manifest deviation from sound health. Syphilis, it is said, may be an exception. The syphilitic taint may exist, for a long time, without any evidence that the system is thus affected, until some external injury may be followed by an outward expression of its presence. On the other hand, it is claimed that injuries, whether occurring before the appearance of the growth, or after its removal, exert no special influence in starting up either a primary or a secondary cancerous development, and so far as concerns the cachexia, not only is it frequently absent, as before remarked, for a long time after the appearance of the tumor, but sometimes even, the strength remains fair, the digestion good, the complexion ruddy,

for a considerable period during the process of ulceration. In whatever light the subject is viewed, it certainly seems reasonable to suppose that the symptoms of exhaustion and wasting away, together with the attendant cachectic appearance, may possibly be due to the continual absorption of this foulest of all discharges.

The evidence in support of this supposition becomes still stronger from the fact that patients who die from unulcerating cancer become exhausted and waste away, without, in the majority of cases, giving evidence of any cancerous cachexia. Why is it that after the extirpation of a cancerous growth the health of the patient, as a rule, so markedly increases in every respect, and when, through the propagating influence of the germ-matter that is usually left behind, the disease returns,—why is it that the health and strength again fail? Those who advocate the theory that cancer is merely the local manifestation of a constitutional disease would account for this fact on what is termed the secondary cancerous cachexia.

Paget says: “The morbid material is the essential constituent of the cancerous diathesis or constitution; and when its existence produces some manifest impairment of the general health, *independent* of the cancerous growth, it makes the primary cancerous cachexia.” The cachexia present after the cancerous development he terms secondary.

In point of fact, the cachexia termed primary has insufficient ground on which its existence can be based, and even Mr. Paget, in another place, admits that it may not be present. It is well known that when a cancerous organ is removed, the disease seldom returns in its fellow, but frequently appears in places that are rarely the seat of primary cancer. In commenting on this fact, De Morgan very justly remarks, “that if recurrent cancer is a result *de novo* of the continuity of

action of a morbid process originating in a diseased state of blood in combination with a fitting tissue, should we not expect that the return would be almost always in some organ which is the common seat of the disease. It is still stranger that it should occur in nineteen cases of twenty in tissues or organs which are rarely the seat of primary cancer."

In these brief considerations concerning the origin of cancer, it has not been proposed to offer anything original or in any way to exhaust the subject. I would merely call renewed attention to the recent theory concerning the local origin of cancer, and suggest that, in the future, we pursue in its treatment a course more directly from the stand-point of this theory.

As a contribution in this direction, I offer the following case, and though it proves nothing as to the curability of cancer, it will, I am sure, commend itself as worthy of record.

CASE.—Mrs. H., a married lady, aged about forty, came under my observation, through the kindness of Dr. J. L. Cabell, of the University of Va. The patient was suffering from cancer (scirrhus) of the left breast of about the size of an ordinary orange, and in addition one of the axillary glands was enlarged to the proportions of an ordinary hickory-nut.

She had observed while in India, eighteen years before, a small lump in the breast, but during all the years of her residence in that climate it remained stationary and never annoyed her. About eighteen months before I saw her, she left India for England, and soon after arriving in that colder and damper atmosphere the lump began to enlarge. During the process of its growth she has suffered from occasional neuralgic pains, but of no great severity.

On June 12, 19, and 28, 1873, I operated by the ordinary method of electrolysis, on each occasion intro-

ducing three needles. These efforts merely resulted in a softer condition of the tumor, with possibly some slight diminution in size, and I determined to extirpate the growth, and to destroy the surrounding tissue by the undermining electrolytic process. The patient went to her home, and in October she returned and submitted to the radical operation. Instead, however, of taking away the tumor by the process proposed, I secured the services of Dr. A. B. Crosby, who on the eighth day, after the patient had been thoroughly etherized by Dr. N. B. Emerson, quickly removed both the breast and the enlarged gland of the axilla.

I had at hand an appliance consisting of some twenty points, projecting from a metal plate an inch and a half long, by an inch in width.

This contrivance, which may be termed a small harrow, was placed on a portion of the surface of the wound, and the operation was continued.

The needles penetrated somewhat into the exposed tissues, and the electrolytic process, which was at once begun, gave evidence of its usual activity. Hydrogen was developed in abundance, and the tissues changed in color and consistency, and rapid and complete destruction followed to a considerable depth. By this method the whole of the freely exposed surface was worked over and destroyed, and those portions that were more or less hidden were treated by two or three ordinary electrolytic needles. It was necessary to observe some caution in the regulation of the strength of the current and the position of the poles, for when the current was increased above a certain point, or, through the position of the poles, affected too directly the pneumogastric nerve, the heart's action became most markedly lowered both in frequency and force. On modifying the influence of the current, however, the circulation became as strong as usual—for a moment, in-

deed, there was an increased vigor in the reaction. The suppuration, which was quite profuse for a time, was followed by a healthy granulating surface, and in ten days the patient was sufficiently recovered to return to Va., where the healing process progressed favorably throughout.

The points of particular interest and the thoughts suggested by the above case may be thus summed up:

First. Treatment by the ordinary method of electrolyzation resulted only in a slight diminution in the size of the tumor, and it became evident that decided reduction was not to be expected in any reasonable length of time. One of two methods of procedure have generally been attempted in the treatment of cancer by electrolysis; either a few needles have been introduced through which a current of moderate tension is passed, but insufficient to excite the ulcerative or suppurative process, or else a greater number have been introduced and a current of sufficient strength used to effectually destroy the parts upon which it acts. By the first-named method the process of absorption is in some cases excited to a marked degree. Non-malignant tumors, goitres especially, are sometimes dealt with most effectually. A goitre of considerable size and of long standing on the person of a young lady, referred to me by Dr. J. Marion Sims, was completely dissipated by the feeble electrolytic effects following a dozen external applications. The case of a patient at Bellevue Hospital, whom I treated for scirrhus, illustrates the remarkable power of electrolysis to excite absorption. It has been referred to before, but I am impelled to speak of it again on this occasion, since the ultimate fate of the patient is now known—dissipating the hopes that attended the case. I operated in the amphitheatre of the hospital, using four nee-

dles and a comparatively feeble current. No ulceration was excited, but the tumor began to decrease in size, and in a week's time was one-half its original bulk. A second operation was followed by a still further decrease in size. The patient then left the hospital and for many months was lost sight of, and we were led to hope that the absorbing process had gone on to complete dissipation, but she subsequently returned and died of the disease in a remote organ. From my own experience, then, and from what I can learn of the experience of others, it would seem reasonably certain that we are not, as a rule, to expect much that is favorable in the treatment of cancer, by attempting through our present knowledge of electrolytic methods to excite the process of absorption.

The *second* method—that of introducing a large number of needles and using currents of great strength—has been occasionally attempted and encouraging reports have been made.

Sufficiently well-authenticated accounts of cases brought to a successful issue in this way are, however, it seems to me, wanting. It would be far better to introduce the needles around its base, or, better still, by means of one long, narrow, double edged blade, to transfix the growth, or rather, transfix the sound parts below the growth, and then, partly by the cutting edges, and partly by the chemical action of the current proceeding from the edges, to remove the tumor at one operation.

The method adopted in the above case, however, seems to me to be superior to either, from the fact that although two distinct operations are performed, less time is consumed in the operation, and it is possible more effectually and to a greater depth to destroy the underlying tissue.

Second. It is worthy of note that the application of the current seemed to be stimulating in its effects. When applied so as to affect too directly the heart, it is true that the heart's action became weakened, but the moment the tension of the current was lessened, or the electrodes removed to another part, the pulse became fuller and stronger.

Third. The healing process was rapid and healthy in all its progress, and the health and strength of the patient, which before the operation were by no means robust, were not at all impaired subsequently. The operation, in short, were followed by no greater prostration than if the knife alone had been used.

I do not present this case as of special importance, further than as it is an illustration of a somewhat new method in the treatment of cancer, founded on the reasonable assumption that it may primarily be of local origin.

The disease may in our patient manifest itself again after a comparatively short period, or it is barely possible that its reproductive power may have been destroyed and the disease overcome.

The first appearance of the growth was many years before; it had been enlarging for nearly two years, and one of the axillary glands was involved; hence it cannot be regarded as typical of cases on which it would be desirable to test this method through a series of years.

So long as we are able to do so little towards the radical cure of cancer, it can never be amiss to refer to any means which will even for a time relieve the awful agony that so frequently attends it.

It is not sufficiently understood by the profession what a magic influence an intelligently directed application of the constant current exercises, as a rule,

over the throbbing pains of scirrhus, especially of the female breast. The woman at Bellevue to whom I referred had suffered most severely for many weeks. After the first introduction of the needles every vestige of pain left her, and during the two weeks that she was under observation, before leaving the hospital, she was entirely comfortable. A number of similar cases might be recorded, but I will offer only the following, which is perhaps of more interest than the majority.

In February, 1873, Mrs. —, a patient of Dr. Everett Herrick, came to me, seeking relief from an immense ulcerating cancer of the breast. The tumor had been removed more than a year previously by Dr. W. H. Van Buren, but the wound did not entirely heal, and, a few months subsequently, the ulcerative process began, and steadily progressed. For many months the pain from which she suffered had been of unusual severity.

By the advice of her physicians, above named, she was submitted to localized galvanization of the sound portions surrounding the ulcerating part, and by frequent applications the intense pains were for nearly four months held in almost complete abeyance. At times, however, her sufferings were most intense, and words fail to express the instantaneous and absolute relief that invariably followed the treatment. I would occasionally find her in the morning suffering most acutely. An application would dissipate the pains, and for twenty-four hours frequently, and sometimes for forty-eight, she would move about and rest in perfect comfort. In the latter part of May it was observed that the current did not afford the same relief as formerly. The character of her sufferings had, however, changed. In place of the sharp, shooting pains simulating neuralgia, the distress consisted in a

constant burning and itching, which annoyed her more or less until her death some few months subsequently. It must be remarked that her later sufferings were not to be compared with those which the current so effectually allayed.

Was the change in the character of her pains the result of the galvanization, or is it probable that, if left to nature, the characteristic neuralgic pains would in the same way have been replaced by the less distressing symptoms of itching and burning?

It is impossible to say, but it seems reasonable to attribute the changed action to the influence of treatment. It is proper to say that, during the course of treatment, I operated in the presence of Drs. Van Buren and Herrick, by both the galvanocautery and electrolysis, with the vain hope of modifying in some degree the profuse and offensive discharge and checking the rapidity of the ulcerative process. This case was alone sufficient to teach the necessity of care in the application of electricity, and to confirm the statement that it is not so much electricity that relieves and cures as the method of using it. An application too prolonged, or with a current of too great tension, would not only fail to relieve, but on the contrary decidedly aggravate the distress. The cathode, applied to the seat of pain, did not relieve as did the anode.

The pain was for some time overcome by simple localized galvanization, but during the last weeks of treatment the applications were effectual only when the electrodes were separated as far as possible.